

Claims

1. A device for determining a surface condition, said device comprising a reflectance spectrometer which is arranged to sense the reflectance properties of a surface at at least one wavelength and using said reflectance properties to determine the presence of at least one of liquid water or ice, **characterised in** that said reflectance spectrometer is a wavelength modulation spectrometer which modulates the wavelength of light at a frequency f , said wavelength modulation spectrometer being provided with means to detect the resulting amplitude modulation at more than one multiple of said frequency f .
2. A device for determining a surface condition according to claim 1, **characterised in** that said wavelength modulation spectrometer comprises a wavelength selective system arranged to select and wavelength modulate light of at least one wavelength, where said wavelength selective system comprises at least one of a chopper wheel, a tuning fork optical chopper, a dispersive prism, a grating, an acousto optic modulator or a dielectric filter.
3. A device for determining a surface condition according to claim 1, **characterised in** that said wavelength modulation spectrometer comprises a wavelength modulated laser.
4. A method for determining a surface condition, said method using reflectance spectrometry for sensing the reflectance properties of a surface at at least one wavelength and using said reflectance properties to determine presence of at least one of liquid water or ice, **characterised in** that said reflectance spectrometry is wavelength modulation spectrometry, where the wavelength of the light is modulated at a frequency f , and the resulting amplitude modulation is detected at more than one multiple of said frequency f .
5. A method for determining a surface condition according to claim 4, **characterised in** that light of said at least one wavelength is wavelength modulated before being reflected by said surface.
6. A method for determining a surface condition according to claim 4, **characterised in** that light of said at least one wavelength is wavelength modulated after being reflected by said surface.
7. A method for determining a surface condition according to any one of claims 4-6, **characterised in** that light of said at least one wavelength also is intensity modulated.
8. A method for determining a surface condition according to any one of claims 4-7,

characterised in that said method senses the reflectance properties of a surface at more than one wavelength.

9. A method for determining a surface condition according to claim 8, **characterised in** that said method uses the reflectance properties at the more than one wavelengths to determine the structural properties of the detected liquid water or ice.
10. A system for determining and indicating a surface condition, said system comprising a device for determining a surface condition according to any one of claims 1-3, and comprising an indicator device for indicating the road surface condition determined by said device for determining a surface condition.